

DOI: 10.21767/2471-9668.100011

Extrapulmonary TB in North Eastern Nigeria: A 10-Year Retrospective Review

Baba Waru Goni¹,
Bukar Bakki¹,
Ismaila Adamu Saidu²,
Ibrahim Musa Kida¹, Haruna
Yusuph¹,
Ahmed Hamman Gabdo¹,
Ballah Akawu Denu¹,
Abubakar Yerima¹,
Baba Jidda Umar³,
Mustapha Modu Gofama⁴,
Mohammed Arab Alhaji⁴,
Mohammed Ashiru Garba⁴
and
Galadima Bala Gadzama³

Abstract

Background: Information on extrapulmonary TB is scarce in Nigeria despite being one of the 22 countries with highest burden of tuberculosis in the world and the most populous country in sub-Saharan Africa where the dual epidemics of TB and HIV/AIDS mutually co-exist.

Objective: The purpose of this study was to document the burden of extrapulmonary TB in North-eastern Nigeria.

Methodology: A retrospective cross-sectional study was conducted at a DOTS treatment centre in a tertiary hospital in North-eastern Nigeria. TB treatment registers and case records of 1240 patients were reviewed over a 10-year period.

Results: Out of the 1240 TB cases who received treatment at the facility; 179 (14.4%) had extra-pulmonary TB. Skeletal TB and TB lymphadenitis were the predominant forms of extra-pulmonary TB in the study i.e. 51 (28.5%) and 50 (28.0%), respectively. This was closely followed by abdominal TB (38 (21.2%), tuberculous pleural effusion (23 (12.8%), miliary TB (9 (5.0%), TB meningitis (3 (1.7%) and others (5 (2.8%): viz; 1 (0.6%) each of- TB of the breast, TB of the skin, adrenal TB, genitourinary TB and TB pericarditis respectively. Only 101 (56.4%) of the study subjects had information on their HIV status; of whom 52 (51.5%) were HIV positive and 49 (48.5%) HIV negative.

Conclusion: The study has shown that extrapulmonary TB was relatively common among TB patients receiving care at the facility despite its diagnostic challenges particularly in a resource poor setting like ours.

Keywords: Extra-pulmonary TB; DOTS; North-eastern Nigeria

Received: October 28, 2015; **Accepted:** December 15, 2015; **Published:** December 22, 2015

Introduction

Tuberculosis (TB) is a global public health issue [1, 2]. Despite the recent advances in diagnosis, management and the implementation of the Stop TB programme, TB (especially in the presence of HIV) continues to pose great of challenges in developing countries of sub Saharan Africa and Asia [3] Recently WHO ranked sub Saharan Africa second after South-east Asia on region affected by high burden of TB [4]. Among sub Saharan

- 1 Department of Medicine, College of Medical Sciences, University of Maiduguri, Maiduguri, Nigeria
- 2 Department of Physiotherapy, College of Medical Sciences, University of Maiduguri, Maiduguri, Nigeria
- 3 Department of Microbiology & Parasitology, University of Maiduguri Teaching Hospital, Maiduguri, Nigeria
- 4 Department of Paediatrics, College of Medical Sciences, University of Maiduguri, Maiduguri, Nigeria

Corresponding Author:

Ismaila Adamu Saidu

Department of Physiotherapy, College of Medical Sciences, University of Maiduguri, Maiduguri, Nigeria.

✉ sa2edia@yahoo.com

Tel: 234 903 624 7391

Citation: Goni BW, Bakki B, Saidu IA, et al. Extrapulmonary TB in North Eastern Nigeria: A 10-Year Retrospective Review. J Prev Infect Control. 2015, 1:1.

African countries, Nigeria is ranked second after South Africa with high prevalence of TB [4]. Between 1990 and 2007, the annual incidence rate of TB has increased remarkably in Nigeria from about 174 to 352 per 100,000 populations [5]. In 2013, Nigeria had an estimated annual incidence rate of 338 cases per 100,000 populations and this **Figure 1** is above the average annual TB incidence rate in the entire sub-Saharan Africa [6].

Primarily, TB infection affects the lung (pulmonary TB) but few cases may occur outside the lung (extra-pulmonary TB (EPTB)), in areas such as the lymph nodes, meninges, spine, joints, central nervous system, and gastrointestinal system with wide range of clinical presentation [7]. Thus, EPTB requires high index of clinical suspicion for its diagnosis [1]. High prevalence of EPTB has been identified in recent times due to the HIV/AIDS epidemic particularly in sub-Saharan Africa [8]. Reported prevalence of EPTB varies according to region and patient sub-groups. In India for example, studies have shown that extra-pulmonary TB constitute about 10-15% of all forms of TB. In a recent review Zumla and colleagues have reported that EPTB occurs in 10-42% of TB patients depending on the region, ethnic background, age, underlying disease, immune status of the patient as well as genotype of the *Mycobacterium tuberculosis* strain [3]. Presence of coexisting HIV infection has been shown to increase the incidence of EPTB to as much as 62% [9]. In 2010, the prevalence of HIV infection in Nigeria is estimated around 3.4%, therefore, opportunistic infection such EPTB may continue to pose challenges among the HIV-infected population [9]. However, there is paucity of data EPTB in Nigeria and none from the North-eastern part of the country. Therefore the study was aimed to assess the burden of EPTB at a DOTS treatment centre, North-eastern Nigeria.

Methodology

Study site: It is a retrospective cross-sectional study conducted at the University of Maiduguri Teaching Hospital (UMTH), Maiduguri, North-eastern Nigeria. The UMTH is a 530-bed tertiary health facility. The TB treatment Centre at UMTH follows the Nigerian National TB program and DOTS strategy guidelines.

Study population: The study population comprised of all

patients (including children) referred to the DOTS treatment centre at the hospital from December 2004 to November 2014. TB treatment registers and case records of 1240 patients aged 1-92 years were reviewed. Majority of the patients were of low socio-economic status.

Ethical consideration: Ethical clearance was sought and obtained from the UMTH Medical Ethics and Research Committee before conducting the study.

Statistical analysis: A descriptive statistics of frequency and percentage were used to analyze the data using SPSS statistical software (SPSS version 16, Chicago Ill, USA).

Results

Case records of 1240 TB patients who received treatment at the DOTS clinic from December 2004 to November 2014 at the University of Maiduguri Teaching Hospital in north eastern Nigeria were reviewed. Out of 1240 patients who received care at the DOTS centre, 179 (14.4%) had extra-pulmonary TB. Ninety-six (53.6%) of them were males and 83 (46.4%) females, with a male to female ratio of 1.2: 1. The age range of the study population was 1 to 92 years with a mean age of 31.41 ± 15.95 years. There was no significant difference between the mean ages of males and females subjects in the study i.e. 33.10 ± 16.18 years vs. 29.09 ± 15.34 years ($p > 0.05$).

The commonest form of EPTB from the study were skeletal TB (51 (28.5%) and TB lymphadenitis 50 (28.0%), this was closely followed by abdominal tuberculosis 38 (21.2%), tuberculous pleural effusion 23 (12.8%), miliary TB (9 (5.0%)), TB meningitis 3 (1.7%) and others 5 (2.8%); which include 1 (0.6%) each of; TB of the breast, TB of the skin, adrenal TB, genitourinary TB and TB pericarditis respectively (**Figure 1**). TB of the spine (that is, Pott's disease) was the commonest form of skeletal TB in the study i.e. 49 (96.1%) while TB osteoarthritis constituted the remaining 2 (3.9%). Information on HIV status was available for 101 (56.4%) patients; out of these 49 (48.5%) were HIV negative and 52 (51.8%) HIV positive (**Table 1**). TB lymphadenitis, TB pleural effusion and miliary TB were common among HIV positive subjects in the study than HIV negatives.

Discussion

Overall, EPTB represents 14.4% of all TB cases in this study. This figure favourably compares with those reported in similar studies for example; in a 13-year epidemiologic study in the USA a prevalence of 18.7% was reported [8], while in India the burden of extra-pulmonary TB among all TB cases was reported to be between 10-15% [10]. In a retrospective cohort study by Ade et al in Bénin republic reported an EPTB rate of 9% [11]. However, this rate was considerable lower when compared with rates reported in a similar study in Ethiopia (32%) [12].

This current study also shows that the prevalence of EPTB is lower among HIV seropositive patients (48.5%) and this finding is not consistent with the result von Ryon et al who reported 55% cases EPTB among HIV/AIDS patients [13] (**Table 2**). The disparity in prevalence rates reported by these studies may be explained by variation in epidemiologic risk factors for TB, variation in study populations, differences in study design, as well as variation in diagnostic tools for the detection EPTB and strain differences in mycobacterium TB genotypes.

Distribution of EPTB according to site

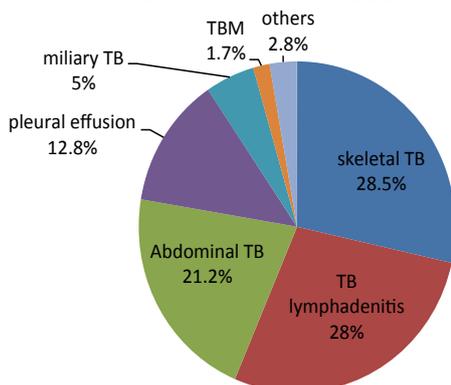


Figure 1 Distribution of extrapulmonary TB (EPTB) according to site. Legend: TBM (TB Meningitis)

The predominant forms of extra-pulmonary TB in the study were skeletal TB and TB lymphadenitis followed by abdominal TB and tuberculous pleural effusion. This finding is tandem with other studies [14-16]. In addition, TB lymphadenitis and pleural effusion were common among HIV positive patients than HIV-negatives. This may be as a result of immune reconstitution following the commencement of anti-retroviral drugs in the presence of TB infection or as a result of the HIV infection itself as shown by several studies [17-19]. Furthermore the commonest form of skeletal TB in the study was spinal TB (i.e., Pott's disease); this finding is quite similar to those reported by Yone and colleagues in Cameroon [16]. The low frequencies of other forms of EPTB (for example, adrenal TB, TB meningitis, TB pericarditis, genitourinary TB, etc.) in this study may be as a result of lack of diagnostic facilities at the study site. Moreover, other forms of EPTB (for instance, TB pericarditis, adrenal TB, genitourinary TB, etc.) may have been missed out in this study because in the early years of establishment of DOTS centre at the study site is that there was poor case referral by the clinical speciality clinics to the DOTS clinic for treatment. However, with increasing awareness in the last five years among the specialty clinics at the health facility where this study was conducted now refer suspected cases of EPTB to the DOTS clinic for diagnosis and subsequent treatment.

Only about half of the patients in the study had information about their HIV status (56.4%). This may be due to absence of point of care HIV screening test among TB patients accessing treatment at

the facility. There is therefore the need to introduce point of care HIV screening of all TB patients accessing treatment at the DOTS clinic in the facility, as well as increasing collaboration between ART and TB efforts at the site.

The study has shown male gender predominance in all forms of EPTB. A plausible explanation for this slight male gender predilection of EPTB may perhaps be a general trend of males being at an increased risk of TB compared to females as reported in a recent systematic review aimed to critically examine social determinants TB in sub-Saharan Africa by Saidu and colleagues [20] (Table 3).

Although we would have liked to identify the risk factors for EPTB in our study, our data is limited to already existing variables captured in the TB registers and case records of patients. Data on several clinical co-morbidities, socio-demographic and behavioural risk factors for TB/EPTB were not captured in the TB registers at the DOTS centres. Improved understanding of these risk factors may help clinicians to apply a high index of suspicion to certain high-risk populations as well as enable public health authorities to achieve the goal of preventing TB. Moreover, another limitation in our study is that the National TB register do not capture information on disseminated TB, i.e., TB existing in more than one site. Therefore, several EPTB may have passed for pulmonary TB at the study site, thereby under-reported the actual prevalence of ETPB. In addition not all staff at the DOTS clinic is trained on data entry and record keeping as we have discovered a lot of uncompleted TB register in the course of our study. We therefore suggest that the National Tuberculosis Control Programme of Nigeria improve on its TB register do include relevant information on site as well as risk factors for both PTB and EPTB as well as adequately train the staff at DOTS clinics on data entry and record keeping.

The study has shown that extra-pulmonary TB was relatively common among TB patients receiving treatment at the facility, with skeletal TB and TB lymphadenitis as the predominant forms of EPTB. Only about half of the patients in the study had information on their HIV status, there is therefore a need to establish point of care HIV screening test for TB patients accessing treatment at the facility.

Table 1. Demographic characteristics and HIV status of the patients.

Variables	n (%)
Sex	
Male	96 (53.6)
Female	83 (46.4)
M: F	1.2:1
Age in years (Mean ± SD)	31.41 ± 15.9
Body weight in Kg (Mean ± SD)	28.97 ± 18.27
HIV status n (%)	
Positive	52 (51.5)
Negative	49 (48.5)

Table 2. Distribution of sites of EPTB by HIV status.

Sites	Mode of diagnosis	HIV- n (%)	HIV+ n (%)	Total n (%)
Skeletal	X-ray/tuberculin skin test	14 (66.7)	7 (33.3)	21 (100)
TB lymphadenitis	Histology/cytology	11 (36.7)	19 (63.3)	30 (100)
Abdominal TB	Biopsy/aspiration	11 (57.9)	8 (42.1)	19 (100)
Pleural effusion	Aspiration/culture	9 (45.0)	11 (55.0)	20 (100)
Miliary TB	Cytology/biopsy/culture	1 (33.3)	2 (66.7)	3 (100)
TB meningitis	Culture/tuberculin skin test	3 (75.0)	1 (25.0)	4 (100)
Others	X-ray/cytology/biopsy/culture	3 (75.0)	1 (25.0)	4 (100)
Total n (%)		52 (51.5)	49 (48.5)	101 (100)

Table 3. Distribution of EPTB by gender.

Sites	male n (%)	female n (%)	total n (100)
Skeletal	26 (51.0)	25 (49.0)	51 (100)
TB lymphadenitis	26 (52.0)	24 (48.0)	50 (100)
Abdominal TB	20 (52.6)	18 (47.4)	38 (100)
Pleural effusion	13 (56.5)	10 (43.5)	23 (100)
Military	6 (66.7)	3 (33.3)	9 (100)
TB meningitis	2 (66.7)	1 (33.3)	3 (100)
Others	3 (60.0)	2 (40.0)	5 (100)
Total n (%)	96 (53.6)	83(46.4)	179 (100)

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